

**ANATEC INTERNATIONAL, INC.**  
**RESPONSE TO NOTICE OF NONCONFORMANCE**  
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Procedure No. ANATEC-08  
Page 0 of 0  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

### **PROCEDURE INDEX**

<b><u>SECTION NO.</u></b>	<b><u>PAGE NO.</u></b>	<b><u>DESCRIPTION</u></b>
-	-	INDEX
1.0	1	PURPOSE
2.0	1	SCOPE
3.0	1	DEFINITIONS
4.0	1	REFERENCE DOCUMENTS
5.0	2	PROCEDURE
5.1	2	NONDESTRUCTIVE TEST METHODS
5.2	2	RESPONSIBILITY
5.3	2	LEVELS OF QUALIFICATION
5.4	4	QUALIFICATION REQUIREMENTS FOR CERTIFICATION
5.5	7	TRAINING PROGRAM
5.6	10	EXAMINATION REQUIREMENTS
5.7	15	EXAMINATION GRADING
5.8	15	REEXAMINATIONS
5.9	16	CERTIFICATION
5.10	16	RECERTIFICATION
5.11	17	SUSPENSION
5.12	17	REVOCATION
6.0	18	RECORDS
ATTACHMENT 1		PERSONNEL CERTIFICATION SUMMARY RECORD
ATTACHMENT 2		QDA QUALIFICATION/REQUALIFICATION FLOWCHART



Procedure No. ANATEC-08  
Page 1 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

### **\*\*\*COMPLETE REVISION\*\*\***

#### **1.0 Purpose**

- 1.1 To provide instructions and define responsibilities for the qualification and certification of ANATEC Nondestructive Testing (NDT) Personnel.
- 1.2 Certifications based on previous revisions of this procedure are valid until recertification is required.

#### **2.0 Scope**

The requirements of this procedure apply to examination, qualification and training necessary for certification of NDT personnel, specifically, RT, UT, ET, MT, PT and LT.

#### **3.0 Definitions**

- 3.1 NDT - Includes all methods of examinations, detection or measurements of any parameter, property, or performance capability of materials, components, or structures without altering any properties or dimensions or affecting their serviceability.
- 3.2 Training - The program developed to impart the knowledge and skills necessary for qualification.
- 3.3 Qualification - Demonstrated skill, training, knowledge and experience required for personnel to properly perform duties of a specific job.
- 3.4 Written Practice - A uniform procedure for the control and administration of the training, examination and certification of NDT personnel.
- 3.5 Certification - Written testimony of qualification.
- 3.6 Certifying Agency - The organization that conducts certification exams and issues certifications.
- 3.7 NDT Related Work - Inspection work in areas such as dimensional measurements, visual dimensional, functional tests, destructive tests, over-seeing of NDT operations, QA/QC audit or inspection work, and other tests will be considered NDT related work.

#### **4.0 Reference Documents**

- 4.1 A.S.M.E. Boiler and Pressure Vessel Code Section XI, (1992 Edition with 1992 Addenda).
- 4.2 The American Society for Nondestructive Testing SNT-TC-1A, (through the 1984 Edition).



Procedure No. ANATEC-08  
Page 2 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

- 4.3 EPRI PWR Steam Generator Examination Guidelines, Report #TR-107569-V1R5, September 1997 (formerly NP-6201).
- 4.4 ANSI/ASNT CP-189, ASNT Standard for Qualification and Certification of NDT Personnel, 1991 Edition

### **5.0 Procedure**

#### **5.1 Nondestructive Test Methods**

Qualification and certification of NDT personnel in accordance with this procedure is applicable to each of the following methods:

- 5.1.1 Radiographic Testing (RT)
- 5.1.2 Ultrasonic Testing (UT)
- 5.1.3 Magnetic Particle Testing (MT)
- 5.1.4 Liquid Penetrant Testing (PT)
- 5.1.5 Electromagnetic Testing (ET)
- 5.1.6 Leak Testing (LT)

#### **5.2 Responsibility**

The Principal Level III is responsible for the certification, training and examination of personnel. The Principal Level III may designate another Level III individual to conduct the examination of personnel. Such designation shall be documented and maintained on file by Anatec. The results of the training and examinations are submitted to the Principal Level III who determines the appropriate level of certification for the individual.

#### **5.3 Levels of Qualification**

There are five (5) levels of qualification for Nondestructive Testing Personnel. Each level of qualification, with the exception of a Trainee, requires certification that the individual is capable of performing the duties and responsibilities of the level of qualification in the Nondestructive Testing method being implemented. Personnel may be further designated as Principal Level III or NDE Instructor. Listed below are the levels of qualification and a description of minimum duties and responsibilities.

##### **5.3.1 Trainee**

A Trainee is an individual who is training to be qualified as a Level I. This individual works with a certified Level II or III individual and does not conduct independently any test, interpret results of a test, or write reports of test results.



Procedure No. ANATEC-08  
Page 3 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

### **5.3.2 NDT Level I**

An NDT Level I is qualified to perform system calibrations, implement techniques and conduct limited evaluation in the NDT method in which he is certified. The individual is authorized to perform these duties in accordance with written instructions and to record the results. This individual receives the necessary guidance or supervision from a certified Level II or III individual. Personnel certified Level I do not interpret test results for acceptance or rejection.

### **5.3.3 NDT Level II**

An NDT Level II is qualified to set up and calibrate equipment and to interpret and evaluate results with respect to applicable codes, standards, and specifications. The NDT Level II is thoroughly familiar with the scope and limitations of the methods for which qualified and shall exercise assigned responsibility for on-the-job training and guidance of trainees and NDT Level I personnel. The NDT Level II is qualified to prepare written instructions, and to organize and report the results of nondestructive tests. The E.T. Level II is not authorized to interpret and evaluate eddy current examination results.

### **5.3.4 ET Level IIA - Eddy Current Discipline Only**

An ET Level IIA is qualified to conduct all the activities of the ET Level II and in addition is qualified and authorized to interpret and evaluate eddy current examination results. The ET Level IIA shall receive additional training in the analysis of eddy current data from nonferromagnetic heat exchanger tubing.

**5.3.4.1** A Qualified Data Analyst (QDA) has successfully completed the EPRI-generated Performance Demonstration Database (PDD) examination and is qualified to analyze defects from various steam generator designs.

### **5.3.5 NDT Level III**

An NDT Level III individual has the technical expertise and responsibility to establish techniques and procedures to be implemented for the examination of an item. The NDT Level III is capable of interpreting and evaluating the results of the NDT method in terms of existing codes, standards and specifications. This individual has the capability of interpreting codes, standards and specifications to designate the particular test method and technique to be implemented. He/She is responsible for the complete NDT activity for which qualified and assigned and has sufficient background knowledge in materials, fabrication and product technology to establish examination techniques and assist other personnel in establishing acceptance criteria where none are available.



Procedure No. ANATEC-08  
Page 4 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

---

### **5.3.6 Principal Level III**

The Principal Level III is responsible for the training and certification examination of NDT Level I and II personnel. The actual administration of training, examinations and grading of examinations may be delegated to another Level III by the Principal Level III. The Principal Level III shall verify the technical content of NDT procedures and have final technical authority on NDE issues. He/she shall assign other NDT Level III personnel to projects.

### **5.3.7 NDT Instructor**

The NDT Instructor is responsible for developing course outlines and presenting classroom, laboratory and/or on-the-job training programs in accordance with written course outlines approved by an NDT Level III. The NDT Instructor shall be thoroughly familiar with the NDT method being taught and shall be able to effectively present the theoretical, technical and practical aspects of the method.

## **5.4 Qualification Requirements for Certification**

### **5.4.1 Physical Examination**

To be considered for certification, the individual is given an examination to assure natural or corrected near-distance acuity in at least one eye. The individual shall have the ability of reading a minimum of Jaeger Number 1 letters at a distance of not less than 14 inches on a standard Jaeger test chart or a near-distance test pattern equivalent to a Snellen fraction of 20/30 or greater. The examination shall be administered using a qualified test chart that meets the requirements of ASME SXI para. IWA-2322.

The individual must also be capable of distinguishing and differentiating contrast between colors used in the method for which he is qualified. An individual failing the color test shall be referred to the Level III who will conduct a practical examination and document disposition.

Eye examinations are administered on an annual basis and documented on an Eye Examination Certification form. Examinations shall be administered by a trained individual designated by the Principal Level III or by an optometrist, medical doctor, health nurse or other qualified person.

### **5.4.2 Education, Training and Experience**

**5.4.2.1** Personnel considered for certification in NDT will have sufficient education, training, and experience to ensure understanding of the principles and procedures of those areas of examination in which they are being considered for certification.

**5.4.2.2** Personnel shall have graduated from an accredited high school or



Procedure No. ANATEC-08  
Page 5 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

have passed a standardized high school equivalency test.

- 5.4.2.3 To be considered for certification, personnel must meet one of the criteria for the applicable NDT Level as defined in Table 5-1 (or for UT certification in accordance with App. VII, see Tables 5-2 and 5-3).
- 5.4.2.4 In addition to the training and experience requirements of ET Level II individuals, the ET Level IIA shall receive 24 hours of training in the interpretation of eddy current data.
- 5.4.2.5. Individuals qualified as QDA shall hold a current ET Level II, IIA or III certification and shall receive a minimum of 40 hours of classroom and laboratory training addressing steam generator eddy current data analysis.
- 5.4.2.6 NDT Level III
1. Graduate of a four year accredited engineering or science college or university with a degree in Engineering or Science, plus one year experience in nondestructive testing in an assignment comparable to that of an NDT Level II in the applicable test method.
  2. Completion with a passing grade of at least two years of engineering or science study at an accredited university, college or technical school plus two years experience as a certified NDT Level II in the applicable test method.
  3. Four years experience as a certified NDT Level II in the applicable test method and a graduate of an accredited high school or shall have passed a standardized high school equivalency test.
- 5.4.2.7 UT Level III (Options 1 through 3)
1. Graduate of a four year accredited engineering or science college or university with a degree in Engineering or Science, plus two years (4200 hrs.) experience in an assignment comparable to that of an NDT Level II in UT. At least one year (2100 hrs.) of this experience shall be in nuclear applications and shall include the actual performance of examinations and evaluation of examination results; or,
  2. Completion with a passing grade of at least two years of engineering or science study at an accredited university, college or technical school plus three years (6300 hrs.)



Procedure No. ANATEC-08  
 Page 6 of 19  
 Revision Revision 13  
 Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

experience in an assignment comparable to that of a Level II in UT. At least two years (4200 hrs.) of this experience shall be in nuclear applications and shall include the actual performance of examinations and evaluation of examination results; or,

3. High school graduate or equivalent, plus four years (8400 hrs.) experience in an assignment comparable to that of a Level II in UT. At least two years (4200 hrs.) of this experience shall be in nuclear applications and shall include the actual performance of examinations and evaluation of examination results.

**TABLE 5-1.  
MINIMUM TRAINING AND EXPERIENCE HOURS FOR LEVEL I AND II**

Method	RT		MT		UT		PT		ET	
Level	I	II	I	II	I	II	I	II	I	II
Training Hours	39	40	12	8	40	40	8	8	12	40
Min. Hours in Method	525	1575	175	525	250	800	175	350	175	1575
					*525	*1575				

\*NON-NUCLEAR UT CERTIFICATION

Method/ Technique	LT(BT)		LT(PCT)		LT(HDLT)		LT(MSLT)	
Level	I	II	I	II	I	II	I	II
Training Hours	4	2	24	16	12	8	40	24
Min. Hours in Method	2	88	263	700	263	700	700	1050

- NOTES:
1. Individuals utilizing methods not covered in the above tables shall be qualified in accordance with SNT-TC-1A and this procedure.
  2. One month equals 175 hours.
  3. Experience may be gained in more than one method at a time, except for UT. For UT certifications in accordance with ASME, Sect. XI, Appendix VII see Table 5-3.
  4. Personnel may be qualified directly to Level II with no time as a certified Level I, provided the required training and experience consists of the sum of the hours required for NDE Level I and NDE Level II.
  5. Personnel who received fewer training hours than specified in this table for qualification levels below their current level are considered qualified provided those hours met SNT-TC-1A minimums.





Procedure No. ANATEC-08  
Page 7 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

**TABLE 5-2.  
MINIMUM TRAINING HOURS FOR UT CERTIFICATION  
IAW SXI, APP. VII**

Level I	Level II	Level III
40/40	40/40	40/0

- NOTES:
1. Personnel may be qualified directly to Level II with no time as a certified Level I, provided the required training consists of the sum of the hours required for Level I and Level II.
  2. The minimum content of initial training courses for the UT method are described in ASME SXI, App. VII, Supplement 1.
  3. Industrial or academic training courses covering the topics listed in Supplement 1 may be credited toward the training required for Ultrasonic Level III personnel.

**TABLE 5-3.  
REQUIRED EXPERIENCE HOURS FOR UT CERTIFICATION  
IAW SXI, APP. VII**

TRAINEE	Level I	Level II
NONE	250	800

- NOTES:
1. Personnel may be qualified directly to Level II with no time as a certified Level I, provided the required experience consists of the sum of the hours required for Level I and Level II.
  2. The simultaneous experience provision (25%) rule in SNT-TC-1A is not applicable.

**5.5 Training Program**

- 5.5.1** Personnel being considered for certification shall have completed sufficient organized training to become thoroughly familiar with the principles and procedures of the specified test method related to the level of certification desired and applicable to the procedure to be used and the products to be tested.
- 5.5.2** Training shall be conducted by an NDE Instructor except that portions of the training may be conducted by individuals with specialized expertise and designated by the NDE Instructor or Principal Level III.
- 5.5.2.1** All training and experience obtained prior to implementation of this written practice shall be considered valid when verified in writing by the previous employer or training agency.
- 5.5.2.2** Training obtained by an individual prior to employment with Anatec but after implementation of this written practice shall



Procedure No. ANATEC-08  
Page 8 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

be evaluated by the Principal Level III for acceptability and applicability to this written practice.

5.5.3 To assure that an individual has assimilated the training material presented, the individual shall satisfy the examination requirements.

5.5.3.1 If the qualification examination for certification is not given at the conclusion of training, a final course examination shall be given. A grade of 70% is necessary to receive credit for training hours.

5.5.3.2 When an individual fails the qualification examination or final course examination, additional training shall be required prior to reexamination. The additional training shall address the areas of weakness exhibited by the individual and shall be documented by the NDE Instructor.

5.5.4 Training programs administered by other companies or organizations prepared in accordance with this written practice will be considered adequate.

5.5.5 The ASNT Document No. SNT-TC-1A contains recommended training course outlines and references which shall be followed when meeting the initial formal technical training requirements of SNT-TC-1A. Outlines and references are:

<u>Test Method</u>	<u>Training Course Table</u>	<u>Reference Table</u>
Radiographic Testing	I-A	II-A
Magnetic Particle Testing	I-B	II-B
* Ultrasonic Testing	I-C	II-C
Liquid Penetrant Testing	I-D	II-D
Electromagnetic Testing	I-E	II-E
Leak Testing	I-G	II-G
* Non-nuclear only.		

5.5.5.1 Recommended training for Eddy Current Level IIA shall include the following:

1. Review of Eddy Current principles
2. Eddy Current test procedures, standards and specifications
3. History of heat exchanger tubing discontinuities
4. Theory and operation of computerized data evaluation equipment
5. Study of specific data parameters
6. Rules for evaluation and examination
7. Practical examination of data analysis of selected tubes.



Procedure No. ANATEC-08  
Page 9 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

---

- 5.5.6 The EPRI document "Qualification of Nondestructive Examination Personnel for Analysis of NDE Data" (reference 4.3, Appendix G) contains recommended training course outlines which shall be followed when meeting the initial formal technical training requirements for Qualified Data Analysts (QDA).
  - 5.5.6.1 QDA's shall receive 8 hours of refresher training annually to impart knowledge of new developments, material failure modes and pertinent technical topics.
- 5.5.7 For training required by ASME Section XI, App. VII., reference Supp. 1.
  - 5.5.7.1 Ultrasonic examination personnel shall receive ten (10) hours of annual training as described in App. VII, para VII-4240.
  - 5.5.7.2 Level III candidates in the ultrasonic method shall receive a minimum of 40 hours classroom training covering the topics described in ASME SXI, App. VII, Supp. 1.0.
- 5.5.8 When CP-189 is invoked, an NDE Instructor shall meet at least one of the following criteria:
  - 5.5.8.1 Possess a current ASNT NDE Level III certificate in the applicable method; or
  - 5.5.8.2 Have academic credentials at least equivalent to a B.S. in engineering, physical science, or technology, and possess adequate knowledge in the applicable method; or
  - 5.5.8.3 Be a graduate of a two-year school of science, engineering, or NDE and have five or more years of experience as a Level II, or equivalent, in the applicable method; or
  - 5.5.8.4 Have ten or more years of NDE experience as a Level II, or equivalent, in the applicable method.
- 5.5.9 When ASME Code Section XI, 1992 Edition, 1992 Addenda is invoked, an NDE Instructor shall satisfy the Level III Basic and Method examination requirements in the applicable method and shall also meet one of the following requirements:
  - 5.5.9.1 Maintain a current teacher or vocational instructor certificate issued by a state, municipal, provincial or federal authority; or
  - 5.5.9.2 Complete a minimum of forty (40) hours instruction in training and teaching techniques.
- 5.5.10 When CP-189 is invoked, NDE Instructors shall be designated by the Principal Level III. The designation shall become part of the individual's



Procedure No. ANATEC-08  
Page 10 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

qualification records. The Principal Level III shall be considered a qualified instructor without specific designation when meeting the appropriate qualifications.

**5.6 Examination Requirements**

The physical and technical qualifications of a Level I, II and III are verified by examination in the applicable NDT method. The Principal Level III or his selected representative conducts and grades examinations for each NDT Level I, II and III individual. The written examinations shall be administered without access to reference material (closed book) except that necessary data, such as graphs, tables, specifications, procedures and codes, may be provided. The practical examination shall be administered by a Level III.

For personnel successfully completing the American Society of Nondestructive Testing (ASNT) Basic and Method examinations, an equivalent passing grade of 80% may be used to fulfill the Basic and Method Test requirement provided the individual shows evidence of having passed said examinations. UT Level III personnel qualified in accordance with App. VII, must have the Basic and Method examinations administered and graded by an outside agency.

For personnel successfully completing the EPRI Qualified Data Analyst (QDA) examination, an equivalent passing grade of 80% may be used to fulfill the Practical Test requirement (Level IIA) or Demonstration Test requirement (Level III).

The examinations administered to verify an individual's level of certification are listed below:

**5.6.1 Physical Examination**

See Paragraph 5.4.1 of this procedure.

**5.6.2 General Examination for NDT Levels I and II**

The general examination covers the basic test principles relative to the applicable method. The questions are appropriate to the level in which the individual is to be certified. Listed below are the minimum number of questions to be given to the individual for each level of certification in the applicable NDT method:

<u>Method</u>	<u>Level I and II</u>
Radiographic Testing	40
Magnetic Particle Testing	30
Ultrasonic Testing	40
Liquid Penetrant Testing	30
Electromagnetic Testing	40
Leak Testing	20



Procedure No. ANATEC-08  
Page 11 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

**5.6.3 Specific Examination for NDT Levels I and II**

The specific examination covers the equipment, operating procedures and test techniques individuals may encounter in their specific assignments. This examination also covers the specification or codes and acceptance criteria used by the individual on the NDT procedure. Listed below are the minimum number of questions to be given to the individual for each level of certification in the applicable NDT method:

<u>Method</u>	<u>Level I</u>	<u>Level II</u>
Radiographic Testing	20	20
Magnetic Particle Testing	20	15
Ultrasonic Testing	20	20
Liquid Penetrant Testing	20	15
Electromagnetic Testing	30	20
Leak Testing		
1. Bubble Test	15	15
2. Absolute Pressure Leak Test (Pressure Change)	15	15
3. Halogen Diode Leak Test	15	15
4. Mass Spectrometer Leak Test	20	40

**5.6.4 Practical Examination for NDT Levels I and II**

Individuals being certified to a Level I or II shall demonstrate to the satisfaction of the Level III that they are familiar with and can operate the necessary test equipment and analyze the resultant information to the degree required. For Level I, at least one selected specimen for each technique shall be tested, and the results of the test shall be analyzed. For Level II, at least one selected specimen for each technique and a minimum of two samples per method shall be tested and the results of the test shall be analyzed. The description of the specimens, the test procedure, ten different checkpoints requiring an understanding of test variables and procedural requirements and the results of the examination are documented.

**5.6.5 Practical Examination for ET Level IIA/QDA - Eddy Current Discipline Only**

**5.6.5.1** Level II eddy current personnel being certified to Level IIA shall demonstrate to the satisfaction of the Level III that they can analyze the resultant information to the degree required. A practical examination on the analysis of eddy current data shall be given to personnel being certified to Level IIA. At least ten different check points requiring an understanding of the test variables and procedural requirements shall be included in the examination.



Procedure No. ANATEC-08  
Page 12 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

---

5.6.5.2 The examination shall contain three separate categories of eddy current indications. The three categories are:

G1 Greater than 60% loss of material defect indications.

G2 40% to 60% loss of material defect indications.

G3 20% to 39% loss of material defect indications.

5.6.5.3 A weighting factor shall be applied to the percentage grades of the various examination categories. The composite score shall be the sum of the percent in each category times its weight factor. The weight factors are as follows:

Defect category G1 - 0.5

Defect category G2 - 0.3

Defect category G3 - 0.2

5.6.5.4 At least 90% of the known indications in the test object used in the practical examination shall be found.

5.6.5.5 Qualified Data Analyst (QDA)

The QDA examination may be used to fulfill the ET Level IIA practical test requirement. Individuals being certified as Qualified Data Analysts (QDA) in the eddy current method shall be required to pass the EPRI QDA examination. This examination consists of a written and practical examination. The written examination is a random selection of 40 questions covering all text material. The practical examination is a random selection of tubes representing various damage mechanisms. See Attachment 2 for the EPRI QDA qualification/requalification flowchart.

5.6.6 UT examinations (in accordance with App. VII) shall meet the following requirements:

5.6.6.1 The UT written examinations shall be administered without access to reference material (closed book) except that necessary data such as graphs, tables, specifications, procedures and codes may be provided.

5.6.6.2 For each written examination administered as part of the qualification examination, a "question bank" containing at least twice the minimum number of questions required per examination shall be available. Each qualification examination shall be assembled from the question bank using a random



Procedure No. ANATEC-08  
Page 13 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

---

selection process. The Level III preparing the examination(s) shall insure that no individual takes the same examination more than once.

- 5.6.6.3 For each Practical Examination that does not use specimens prepared for UT performance demonstrations (i.e., Appendix VIII) and is administered as part of the qualification examination, a "specimen bank" containing at least five flaws shall be available. The flaws in the specimen bank shall be simulated flaws not exceeding the standards of IWB-3500, actual flaws, or a mixture of both. The specimen set for each practical examination shall be assembled from the specimen bank using a random selection process. Blank (sound) test specimens shall be included in the specimen set so that no more than one-third of the specimens in the set contain flaws required to be detected. The specimens shall be masked such that flawed and blank specimens cannot be identified and the flaw locations are not visible.
- 5.6.6.4 The Principal Level III and/or designee shall have responsibility for the protection of qualification materials to assure the confidentiality of test questions, answer sheets, and test specimens.
- 5.6.6.5 Qualification examinations for UT Level I and II shall consist of a written General Examination, written Specific examination and a documented Practical Examination.

**Level I and II General Examinations**

- a. The General Examination shall be a written, closed book examination containing a minimum of forty (40) questions. The ultrasonic examination shall cover the technical principles relative to the UT method.

**Level I and II Specific Examinations**

- a. The Specific Examination shall be a written, closed book examination containing a minimum of forty (40) questions. Necessary data, such as graphs, tables, specifications, procedures and Codes shall be furnished.
- b. For UT examinations forty to sixty percent (40%-60%) of the specific examination questions shall cover Section XI NDE requirements. The remaining questions shall cover problems and specifications applicable to the UT method.

**Level I and II Practical Examinations**



Procedure No. ANATEC-08  
Page 14 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

- a. Candidates shall demonstrate to the satisfaction of the Level III that they are familiar with and can perform the applicable examinations using suitable calibration blocks and written procedures prepared for examination of plant components.
- b. The Practical Examination shall include examination of a specimen set that complies with para 5.6.6.3. Alternately, for ultrasonic examinations, successful completion of a UT performance demonstration in accordance with Section XI, App. VII is permitted.
- c. An assessment report containing at least ten check points shall be used to evaluate the candidates performance using longitudinal and shear wave techniques. The following check points shall be included:
  - 1. scanning techniques
  - 2. equipment set-up and calibration
  - 3. selection of search unit
  - 4. data recording (Level I and II)
  - 5. NDE report (Level II); and
  - 6. evaluation in terms of the recording criteria.
- d. A description of the specimens and the calibration blocks, the procedures used, the assessment report, and the examination report prepared by the candidate shall be retained as part of the certification records.

**5.6.7 NDT Level III**

Qualification examinations for NDT Level III certification shall consist of written Basic, Method, Specific, Practical and Performance Demonstration Examinations.

**5.6.7.1 Basic Examination (Required only once when more than one method of examination is taken).**

- a. Twenty questions relating to understanding SNT-TC-1A and ANSI/ASNT CP-189.
- b. Twenty questions relative to applicable materials, fabrication and product technology.
- c. Thirty questions which are selected from or are similar to published Level II questions for other appropriate NDT methods.

**5.6.7.2 Method Examination (for each method).**

- a. Thirty questions relating to fundamentals and





Procedure No. ANATEC-08

Page 15 of 19

Revision Revision 13

Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

principles, which are selected from or are similar to published ASNT Level III questions for each method.

- b. Twenty five questions relating to application and establishment of techniques and procedures which are selected from or are similar to the published ASNT Level III questions for each method.
- c. Twenty questions relating to capability for interpreting codes, standards and specifications relating to the method.

### **5.6.7.3 Specific Examination (for each method).**

- a. Thirty questions relating to equipment, techniques, procedures and administration of the employer's written practice. It shall also cover the NDE requirements of ASME Section XI, Division 1 including acceptance standards and referenced codes and standards.

- 1. For UT Level III individuals, the specific examination shall contain forty questions covering Section XI NDE requirements, procedures and specifications relating to the method.

### **5.6.7.4 Practical Examination**

This shall consist of the preparation of an NDE procedure. If documented experience demonstrates that the candidate has previously prepared acceptable procedures in the method using applicable specifications, codes and standards, a written practical is not required. This experience shall be documented.

### **5.6.7.5 Performance Demonstration Examination**

The Performance Demonstration Examination shall be a Level II practical in accordance with para 5.6.4 or para 5.6.6.5 for UT Level III's. ET Level III's shall take the Level IIA/QDA practical in accordance with para 5.6.5.

## **5.7 Examination Grading**

A Level I, II, IIA or III individual shall have a composite grade of 80% or greater before being certified to that level of qualification. A simple averaging of the test scores will be used to determine the composite grade. None of the examination grades in the individual test categories shall be below 70% (with the exception of UT, an 80% test score is then required). The EPRI QDA examination shall be graded in accordance with the EPRI guidelines.

## **5.8 Reexaminations**



Procedure No. ANATEC-08  
Page 16 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE: CERTIFICATION OF NDT PERSONNEL**

- 5.8.1 Prior to reexamination, an individual failing to attain the required grades must either wait at least 30 days or show evidence of having received suitable additional documented training addressing the deficiencies which caused failure. The individual shall not be reexamined using the examination or specimen previously failed or both.
- 5.8.2 Reexaminations for the EPRI QDA written examination shall be administered in accordance with Attachment 2.
- 5.8.3 The UT Level I and II Practical Examination and Level III Demonstration Examination shall be graded such that failure to accurately detect, locate, interpret, evaluate or record as applicable for the examination 80% of the known conditions in the test specimen set shall cause the candidate to fail the examination. In addition, a maximum false call rate of 10% shall be imposed (i.e., no more than 10% of the blank test specimens shall be reported as flawed).
  - 5.8.3.1 Reexamination questions shall be assembled by a random selection process or the examination shall contain at least 30% different or reworded questions. The Practical or Demonstration Examination test specimen set shall contain at least 50% different flaws from those used during the most recent Practical or Demonstration Examination that was not passed by the candidate.
  - 5.8.3.2 No individual shall be reexamined more than twice within any consecutive 12 month period.

**5.9 Certification**

ANATEC is responsible for the certification of ANATEC personnel. Certification of ANATEC personnel is performed by the ANATEC Principal Level III. This certification is based on examination as defined within this procedure. The Personnel Certification Summary Record, Attachment 1, is provided upon request as evidence of certification.

At the option of ANATEC, an outside agency may be engaged to provide Level I, Level II, Level IIA or Level III services. The responsibility of certification of such personnel remains with ANATEC and not the outside agency. If an outside agency is used, ANATEC executes its responsibilities for certification by assuring that training, examination and certification of NDT personnel are in accordance with this procedure, as a minimum.

**5.10 Recertification**

Certified NDT personnel shall be reexamined and recertified in accordance the following requirements:

- 5.10.1 At least every three years from the date of certification for Level I, Level II and Level IIA individuals.



Procedure No. ANATEC-08  
Page 17 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

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5.10.2 At least every five years from the date of certification for Level III individuals. Alternatively, the Level III may be recertified using only the written Method and Specific examinations, provided the following conditions are met:

5.10.2.1 The Level III was previously certified or recertified using all the written examinations and the Demonstration examination.

5.10.2.2 The Level III is not being recertified due to interrupted service.

5.10.2.3 The Level III is not being certified by a new employer.

### **5.11 Suspension**

5.11.1 When an individual's vision examination exceeds one year. Certification is reinstated concurrently with passing the vision examination.

5.11.2 When for a period of more than 12 consecutive months an individual is inactive in the method to which he is certified. Reinstatement shall require reexamination in accordance with Section 5.6.

5.11.3 When for a period of 15 consecutive months an individual certified as Qualified Data Analyst has not analyzed data. Reinstatement shall require reexamination on the practical portion of the exam only.

5.11.4 When an individual's performance is determined to be deficient in the required method or technique for specific documented reasons. Reinstatement will be determined by the Principal Level III.

### **5.12 Revocation**

5.12.1 When a certified NDT individual is terminated by ANATEC, the individual's certification is revoked.

5.12.2 If an individual's conduct is deemed unethical or incompetent, the individual's certification may be revoked.

5.12.3 For NDE Level III personnel, when the ASNT NDT Level III certificate has been revoked.

5.12.4 An individual (new or rehire) whose certification has been revoked may be certified to their former level based on examination provided each of the following conditions are met to ANATEC's satisfaction:

1. The individual has proof of prior certification.
2. The individual was working in the capacity to which certified with-



Procedure No. ANATEC-08  
Page 18 of 19  
Revision Revision 13  
Date March 17, 1999

## **TITLE: CERTIFICATION OF NDT PERSONNEL**

in six months of revocation.

3. The employee is recertified within six months of revocation.

- 5.12.5 Certifications which have been revoked may be reinstated based on examination as described in Section 5.6.

### **6.0 Records**

- 6.1 The certification records of each individual are maintained on file. Each individual's certification record contains the following information:
  1. Name of certified individual.
  2. Level of certification and test method.
  3. Educational background.
  4. NDE experience which identifies the individual's experience performing various NDE tests shall be maintained. In addition, previous experience shall be documented and maintained for purposes of verifying initial certification experience and continuing experience.
  5. Statement indicating satisfactory completion of training in accordance with this procedure.
    - a. Documented history of training shall be maintained identifying the training received, organization providing training, dates/hours of training, instructor's name and evidence of satisfactory completion.
  6. Results of the physical examination.
  7. Copies of current examinations or of grades for all previous examinations and descriptions of practical test objects, or available on file with an approved outside agency.
  8. Composite grades or suitable evidence of grades.
  9. Date of certification and/or recertification and the date of hire or assignment to NDT.
  10. Signature of ANATEC designated representative conducting certification.
- 6.2 Personnel qualification records and certifications are retained for a minimum of 2 years after expiration. Copies of Personnel Certifications are supplied to the customer at the beginning of each project for retention with examination results.



Procedure No. ANATEC-08  
Page 19 of 19  
Revision Revision 13  
Date March 17, 1999

**TITLE:** CERTIFICATION OF NDT PERSONNEL

Prepared  
By:

Lisa J. Gardner

Date:

3/18/99

Technical Review  
and Approved  
By:

[Signature]

Date:

3/18/99

Reviewed and  
Approved  
By:

Lisa J. Gardner  
MANAGER OF QUALITY ASSURANCE

Date:

3/18/99

Approved for  
Release  
By:

[Signature]  
GENERAL MANAGER

Date:

3/18/99



930 'F' CALLE NEGOCIO  
SAN CLEMENTE, CA 92673

ATTACHMENT 1  
ANATEC-08, Rev. 13  
March 17, 1999  
Page 1 of 2

## PERSONNEL CERTIFICATION SUMMARY RECORD

NAME:

SOCIAL SECURITY NUMBER:

DATE OF BIRTH:

DATE OF HIRE OR ASSIGNMENT TO NDT:

---

CERTIFICATION METHOD/LEVEL:

LIMITATIONS:

CERTIFICATION DATE:

CERTIFICATION EXPIRATION DATE:

---

TECHNICAL EXAMINATIONS  
METHOD    LEVEL    DATE

EXAM SCORES  
GEN    SPEC    PRAC    COMP

THIS CERTIFIES THE NAMED INDIVIDUAL HAS SATISFACTORILY COMPLETED THE REQUIREMENTS OF ANATEC-08, CERTIFICATION OF NDT PERSONNEL.

CERTIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Level III Signature



930 'F' CALLE NEGOCIO  
SAN CLEMENTE, CA 92673

ATTACHMENT 1  
ANATEC-08, Rev. 13  
March 17, 1999  
Page 2 of 2

**PERSONNEL CERTIFICATION SUMMARY RECORD**  
(Continued)

NAME:

---

**PHYSICAL & EYE EXAMINATIONS**  
(Results on File)

DATE:  
EXAMINER:

---

**EXPERIENCE**

DATE FROM - TO	COMPANY	NDT METHODS AND HIGHEST LEVEL ACHIEVED
-------------------	---------	--

**EDUCATION AND TRAINING**

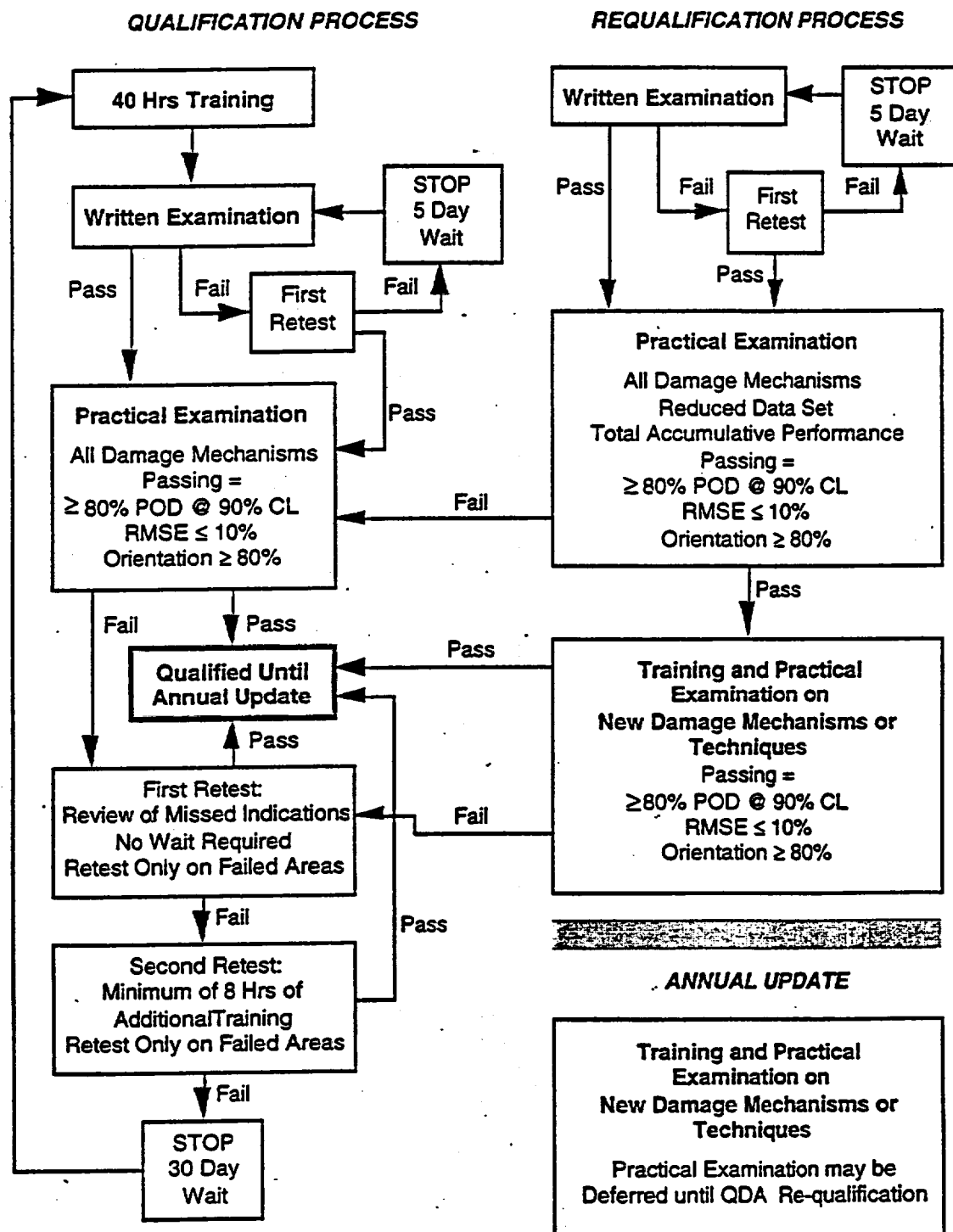
SCHOOL/COMPANY	LOCATION	DATE	TERM	SUBJECT
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930 'F' CALLE NEGOCIO  
SAN CLEMENTE, CA 92673

ATTACHMENT 2  
ANATEC-08, Rev. 13  
March 17, 1999  
Page 1 of 1

## QUALIFICATION AND REQUALIFICATION FLOW CHART





**ANATEC INTERNATIONAL, INC.**  
**RESPONSE TO NOTICE OF NONCONFORMANCE**  
**DOCKET NO. 99901342/1999201-02**

## **REFERENCE '4'**



INFORMATION  
COPY

Procedure No. ANATEC-G-06  
Page 0 of 0  
Revision Revision 2  
Date September 26, 1994

**TITLE:** 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE

## PROCEDURE INDEX

<u>SECTION NO.</u>	<u>PAGE NO.</u>	<u>DESCRIPTION</u>
-	-	INDEX
1.0	1	PURPOSE
2.0	1	SCOPE
3.0	1	DEFINITIONS
4.0	3	REFERENCE DOCUMENTS
5.0	3	PROCEDURE
5.1	3	GENERAL
5.2	4	PROCUREMENT DOCUMENT REQUIREMENTS
5.3	4	IDENTIFICATION, EVALUATION, AND REPORTING PROCESS
5.4	5	POSTING REQUIREMENTS
6.0	5	RECORDS
ATTACHMENT 1		EXAMPLES OF EQUIPMENT AND SERVICES SUBJECT TO 10 CFR 21
ATTACHMENT 2		10 CFR 21 DEFECT OR NONCOMPLIANCE IDENTIFICATION, EVALUATION AND NOTIFICATION FORM
ATTACHMENT 3		10 CFR 21 DEFECT OR NONCOMPLIANCE REPORT TO NRC (SAMPLE)



Procedure No. ANATEC-G-06  
Page 1 of 6  
Revision Revision 2  
Date September 26, 1994

**TITLE:** 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE

**1.0 PURPOSE**

The purpose of this procedure is to establish Anatec's procedure for assuring compliance with 10 CFR 21 for evaluating and reporting defects in nuclear power plant basic components, or noncompliances to nuclear power plant regulatory requirements, that could cause a substantial safety hazard.

**2.0 SCOPE**

2.1 The requirements of this procedure apply to all Anatec personnel.

**3.0 DEFINITIONS**

**3.1 Basic Component -**

- A. A plant structure, system, component, or part thereof necessary to assure: (a) the integrity of the reactor coolant pressure boundary, (b) the capability to shut down the reactor and to maintain it in a safe shutdown condition, or (c) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 100.11; or
- B. A component, structure, system, or part thereof that is directly procured by the licensee of a facility or activity subject to the regulations in this part and in which a defect or failure to comply with any applicable regulation in this chapter, order, or license issued by the Commission could create a substantial safety hazard. Examples of basic components are provided in Attachment 1.

- 3.2 Commercial Grade Item - An item that is (a) not subject to design or specification requirements that are unique to facilities or activities licensed or otherwise regulated by the NRC, (b) used in applications other than facilities or activities licensed or otherwise regulated by the NRC, and (c) to be ordered from the manufacturer or supplier on the basis of specifications set forth in the manufacturer's published product description (e.g. a catalog).

**NOTE:** A commercial grade item is not part of a basic component until after dedication; i.e., until it is drawn from the warehouse or stock and assigned for use or installation. The item is then designated for use as a basic component and it becomes subject to the requirements of 10 CFR 21.



Procedure No. ANATEC-G-06

Page 2 of 6

Revision Revision 2

Date September 26, 1994

**TITLE: 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE**

**3.3 Defect -**

- A. A deviation in a basic component delivered to a purchaser for use in a facility or an activity subject to the regulations of 10 CFR 21 if, on the basis of an evaluation, the deviation could create a substantial safety hazard (this definition is primarily directed at the offsite supplier), or
- B. The installation, use, or operation of a basic component containing a defect as defined in Para 3.3A above (this definition is primarily directed at the recipient, i.e., the user of the component or service), or
- C. A deviation in a portion of a facility subject to the construction permit or manufacturing licensing requirements of 10 CFR 50 provided the deviation could, on the basis of an evaluation, create a substantial safety hazard and the portion of the facility containing the deviation has been offered to the purchaser for acceptance (this definition is primarily directed at the onsite supplier), or
- D. A condition or circumstance involving a basic component that could contribute to the exceeding of a safety limit as defined in the Technical Specifications (this definition is primarily directed at the licensee).

**3.4 Deviation -** A departure from the technical requirements included in a procurement document. Technical requirements include the requirements of applicable regulations, industry standards, and other requirements from the procurement document, e.g., vendor specifications, manufacturing information, catalog information, letters, etc. (These requirements may not be explicitly stated in the procurement document.)

**3.5 Noncompliance -** Failure to comply with regulatory requirements identified in Attachment 1.

**3.6 Substantial safety hazard -** A loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety, namely:

- A. Moderate exposure to, or release of, licensed material reportable under the provisions of 10 CFR 20.403 (a)(1) or 10 CFR 20.403 (b)(2), or the exposure of any individual in an unrestricted area to a whole body dose in one calendar year in excess of 0.5 rem (10 CFR 20.105).



Procedure No. ANATEC-G-06

Page 3 of 6

Revision Revision 2

Date September 26, 1994

**TITLE: 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE**

- B. Major degradation of a basic component such that a required safety function cannot be performed assuming a single failure. (Operating in a degraded mode as permitted by the Technical Specifications is not considered to be a substantial safety hazard).
- C. Major deficiencies in design, construction, inspection, test, or operation of basic components that could contribute to exceeding a safety limit or result in the loss of safety function necessary to mitigate the consequences of an accident.

**NOTE:** By itself, a failure to comply does not necessarily result in a substantial safety hazard. If a failure to comply occurs, an evaluation must be performed to determine if a substantial safety hazard affecting a structure, system, or component was created.

**4.0 REFERENCE DOCUMENTS**

- 4.1 10 CFR 21, "Reporting of Defects and Noncompliance".
- 4.2 NUREG-0302, Rev.1, "Remarks Presented (Questions/Answers Discussed) at Public Regional Meetings to Discuss Regulations (10 CFR Part 21) for Reporting of Defects and Noncompliance, July 12-26, 1977."
- 4.3 ANATEC-06, "Document Control".

**5.0 PROCEDURE**

**5.1 GENERAL**

- 5.1.1 The requirements of 10 CFR 21 apply to two broad categories of nuclear power plant activities, namely: (a) defects in basic components, and services related to such, that could cause a substantial safety hazard, and (b) noncompliances with regulatory requirements that could cause a substantial safety hazard.
- 5.1.2 For those cases where reporting is required by other NRC regulations, duplicate evaluation and reporting under 10 CFR 21 is not required. Care shall be exercised, however, to assure that the information required by the applicable regulation is provided to the NRC within the reporting periods of each regulation.



Procedure No. ANATEC-G-06

Page 4 of 6

Revision Revision 2

Date September 26, 1994

**TITLE: 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE**

- 5.1.3. Attachment 1 provides examples of the equipment, services, and regulatory requirements subject to 10 CFR 21 as identified in Reference 4.2.
- 5.1.4. Defects or noncompliances identified through implementation of established quality control measures prior to final acceptance of services provided shall not be subject to reporting under 10 CFR 21; however, vendor caused defects or noncompliances found during these quality control measures are subject to reporting under 10 CFR 21.

**5.2 PROCUREMENT DOCUMENT REQUIREMENTS**

- 5.2.1. Quality Assurance shall assure that purchase orders for applicable equipment or services specify that 10 CFR 21 is applicable.

**5.3 IDENTIFICATION, EVALUATION, AND REPORTING PROCESS**

- 5.3.1. Anatec employees are responsible for notifying their supervisor of applicable defects or noncompliances as defined by this procedure.
- 5.3.2. All deviations in basic components shall be considered for reportability.
- 5.3.3. The form shown in Attachment 2 shall be used to document the evaluation process. This evaluation is only required for vendor-related deviations that have not been reported under 10 CFR 21.
- 5.3.4. The sequential number shall be obtained from the Quality Assurance Manager or his/her designee. Upon completion the form will be forwarded to the President, Anatec or his/her designee for evaluation and determination of reportability, if required.
- 5.3.5. In the event the organization that identifies the potential defect or noncompliance does not possess the expertise to perform the required evaluation, the information shall be provided to the appropriate organization(s) to complete and document the evaluation required by Parts II and III of Attachment 2.
- 5.3.6. Upon receipt and acceptance of information reasonably indicating that a defect or noncompliance is reportable under 10 CFR 21, the



Procedure No. ANATEC-G-06

Page 5 of 6

Revision Revision 2

Date September 26, 1994

**TITLE: 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE**

President or his/her designee shall be responsible for notifying the licensee within two (2) days of such acceptance.

- 5.3.7. If initial notification is by means other than written communication, a written report shall be submitted to the licensee within five (5) days of the President or his/her designee's receipt and acceptance of the information. Written notification shall be made via Attachment 2.
- 5.3.8. If the President has actual knowledge that the NRC has been adequately informed of a defect or failure to comply as reported above, additional notification is not required.
- 5.3.9. If NRC notification has not been made by the licensee, the President is required to provide initial notification to the Director of the appropriate Regional Office within two (2) days of receipt and acceptance of the information followed by a written report within five (5) days. This report shall be prepared in accordance with Attachment 3.
- 5.3.10. Notification of potential defects or noncompliances identified by organizations external to Anatec, that may result in 10 CFR 21 reports shall be received by the Quality Assurance Manager or his/her designee for processing, as required.

**5.4 POSTING REQUIREMENTS**

A copy of 10 CFR 21, Section 206 of the Energy Reorganization Act of 1974, and a copy of this procedure shall be conspicuously posted in common work areas and at Anatec corporate headquarters.

**6.0 RECORDS**

- 6.1 Records shall be maintained in accordance with Reference 4.3, Anatec's Document Control procedure.

Additional records shall be maintained documenting evaluations involving substantial safety hazards and notifications to the Nuclear Regulatory Commission (NRC).



Procedure No. ANATEC-G-06

Page 6 of 6

Revision Revision 2

Date September 26, 1994

**TITLE:** 10 CFR 21 REPORTING OF DEFECTS AND NONCOMPLIANCE

Prepared

By:

*Lisa J. Gardner*

Date

*9/26/94*

Technical  
Review and

Approval By:

*Philip J. Hunt*

Date

*9/26/94*

Reviewed and  
Approved

By:

*Lisa J. Gardner*

Manager of Quality Assurance

Date

*9/26/94*

Approved For  
Release:

*Tom Volder*

General Manager

Date

*9/30/94*





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**EXAMPLES OF EQUIPMENT AND SERVICES SUBJECT TO 10 CFR 21**

The following guidance is provided on the applicability of 10 CFR 21 to nuclear power plants:

1. Applies only to safety-related equipment required to be seismic Category I.
2. Applies to services associated with applicable equipment such as design, inspection, testing, calibration, and consulting services.
3. Applies only to Federal regulatory requirements established for the radiological protection of the public (including employees) health and safety.

The following are specific examples of equipment, services and regulatory requirements that are subject to 10 CFR 21:

**Basic Components**

1. Safety-related equipment.
2. Commercial grade items (e.g., bearings, relays, bar stock, and welding supplies) after dedication.
3. Security Equipment - 10 CFR 21 is only applicable to security components or systems whose failure or inoperability due to defects could permit undetected, unimpeded access of unauthorized personnel from outside the protected area to vital areas.

**Services (Associated with Basic Components)**

1. Fire protection inspection by fire consultants.
2. Calibration services.
3. Industrial radiographic services.
4. Nondestructive examination of safety-related equipment and welds.
5. Design of safety-related equipment.



ATTACHMENT 1  
ANATEC-G-06, REV. 2  
SEPTEMBER 26, 1994  
PAGE 2 OF 2

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EXAMPLES OF EQUIPMENT AND SERVICES SUBJECT TO 10 CFR 21-CONT.

Services (Associated with Basic Components)-CONT.

6. Seismic and geologic surveys for a reactor site.
7. Specifications for safety-related equipment.
8. Computer codes for reactor analysis.

Regulatory Requirements

1. 10 CFR regulations pertaining to nuclear power plants.
2. Facility Operating License and appended radiologically related Technical Specifications.
3. Plans and procedures implementing Items 1 and 2 above (e.g., Nuclear Quality Assurance Program, Radiological Emergency Response Plan, Fire Protection Program, and Security Plan).



ATTACHMENT 2  
ANATEC-G-06, REV. 2  
SEPTEMBER 26, 1994  
PAGE 1 OF 2

10 CFR 21 DEFECT OR NONCOMPLIANCE  
IDENTIFICATION, EVALUATION, AND NOTIFICATION FORM

SEQUENTIAL NO. \_\_\_\_\_

I. IDENTIFICATION (EMPLOYER)

Employee Name: \_\_\_\_\_ SS# \_\_\_\_\_

Date Identified: \_\_\_\_\_

Description (use attachment if necessary) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

II. 10 CFR 21 REPORTABILITY DETERMINATION

If the answer to ANY of the following questions falls in a bracketed space, reporting under 10 CFR 21 is not required and the determination can be stopped at that point. Provide details, circumstances, and assumptions, as appropriate, to support answers on an attachment.

- |   | <u>YES</u> | <u>NO</u> |
|---|------------|-----------|
| 1. Is a departure from the technical requirement in a procurement document (deviation), or a failure to comply with any applicable regulation, order, or license issued by the NRC involved?  | _____      | ( )       |
| 2. Has the item/activity/service been receipt inspected or otherwise accepted for use by Anatec or, in the case of a commercial grade item, has it been withdrawn from the warehouse and dedicated for use?   | _____      | ( )       |
| 3. Is a safety- or security-related structure, system, or component or equipment used to handle radioactive material or control personnel exposure involved (basic component)?  | _____      | ( )       |
| 4. Has the NRC been previously notified by the vendor or other licensee or has Anatec reported this potential defect or failure to comply under other requirements?   | ( )        | _____     |
| 5. Could this potential defect or failure to comply contribute to the exceeding of a safety limit, create an effect on the integrity of the reactor coolant boundary, capability to shut down the reactor and maintain it in a safe shutdown condition, or the capability to prevent or mitigate the consequences of an accident assuming a single failure? | _____      | ( )       |
| 6. Could a substantial safety hazard be created? (see Definitions)  | _____      | ( )       |

If the answer to all the above questions falls in unbracketed spaces, or if answers are unknown, evaluation of 10 CFR 21 reportability is required.

Evaluation of reportability \_\_\_\_\_ is \_\_\_\_\_ is not required.

\_\_\_\_\_  
Supervisor

\_\_\_\_\_  
Date

(Upon completion submit to QA.)



ATTACHMENT 2  
ANATEC-G-06, REV. 2  
SEPTEMBER 26, 1994  
PAGE 2 OF 2

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III. EVALUATION OF REPORTABILITY

1. Not reportable under 10 CFR 21\_\_\_\_\_.
2. Consider for reporting under 10 CFR 21\_\_\_\_\_.
3. Consider for reporting under other regulations\_\_\_\_\_.

Approved by: \_\_\_\_\_ Date \_\_\_\_\_

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
President, Anatec

IV. EXTERNAL NOTIFICATION (President)

Date recommendation received by President\_\_\_\_\_.

NRC Office notified? \_\_\_\_\_ Yes \_\_\_\_\_ No Date \_\_\_\_\_.

By \_\_\_\_\_ Phone \_\_\_\_\_ Letter \_\_\_\_\_ Other\_\_\_\_\_

Date written report submitted\_\_\_\_\_.



ATTACHMENT 3  
ANATEC-G-06, REV. 2  
SEPTEMBER 26, 1994  
PAGE 1 OF 1

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10 CFR 21 DEFECT OR NONCOMPLIANCE REPORT TO NRC

(SAMPLE)

DATE

COMPANY

FACILITY

RESPONSIBLE OFFICER (NAME AND TITLE)

- DATE RESPONSIBLE OFFICER RECEIVED INFORMATION
- BASIC COMPONENT OR ACTIVITY
- FIRM SUPPLYING BASIC COMPONENT OR ACTIVITY (NAME AND ADDRESS)
- DESCRIPTION OF DEFECT OR NONCOMPLIANCE AND SUBSTANTIAL SAFETY HAZARD THAT IS OR COULD BE CAUSED
- NUMBER AND LOCATION OF SUCH COMPONENTS IN USE AT, SUPPLIED FOR, OR BEING SUPPLIED FOR ONE OR MORE FACILITIES OR ACTIVITIES
- CORRECTIVE ACTION (INCLUDING RESPONSIBLE PARTY AND SCHEDULE)
- OTHER PERTINENT INFORMATION